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599 F.2d 1032, 202 U.S.P.Q. 171

United States Court of Customs and Patent Appeals.
Application of Edward Chalmers WOOD and James Frank Eversole.
Appeal No. 79-517.

June 7, 1979.

Patent applicants appealed from a decision of the United States Patent and Trademark Office Board of Appeals which sustained the examiner's rejection of application serial number 587,599 for a variable venturi apparatus for mixing and modulating liquid fuel and intake air for an internal combustion engine. The Court of Customs and Patent Appeals, Newman, J., held that: (1) references relating to subsonic variable venturi carburetors were clearly within the field of the inventors' endeavor; (2) the teachings of the subsonic variable venturi carburetors concerning alternative mechanisms for varying the flow area in the venturi throat were properly combinable with teachings of a prior patent concerning pollution reduction, and (3) a favorable evaluation of the claimed invention made by the Environmental Protection Agency did not compare the claimed invention with the closest prior art and thus did not rebut the prima facie case of obviousness.

Affirmed.

West Headnotes

[1] **Patents 291 ⚿32**
291k32 Most Cited Cases
(Formerly 291k18)
In resolving question of obviousness, courts presume full knowledge by the inventor of all prior art in the field of his endeavor; however, with regard to prior art outside the field of his endeavor, court presumes only knowledge from those arts reasonably pertinent to the particular problems with which the inventor was involved. 35 U.S.C.A. § 103.

[2] **Patents 291 ⚿58**
291k58 Most Cited Cases

Patents 291 ⚿66(1.1)
291k66(1.1) Most Cited Cases
Rationale behind rule precluding rejections based on combination of teachings of references from nonanalogous arts is the realization that an inventor could not possibly be aware of every teaching in every art; thus, limiting the presumption of the inventor's knowledge to prior art in the field of his endeavor and in analogous arts is an attempt to more closely approximate the reality of the circumstances surrounding an invention. 35 U.S.C.A. § 103.

[3] **Patents 291 ⚿66(1.1)**
291k66(1.1) Most Cited Cases
In determining whether a reference is from a nonanalogous art, it must first be decided if the reference is within the field of the inventor's endeavor and, if it is not, it must be determined whether the reference is reasonably pertinent to the particular problem with which the inventor was involved. 35 U.S.C.A. § 103.

[4] **Patents 291 ⚿16.32**
291k16.32 Most Cited Cases
(Formerly 291k18)
Where it was stated in the background of invention section of specification that "the field of art to which the invention pertains includes the art of internal combustion engines and more particularly to such art as it applies to fuel and air induction systems therefor" and where subsonic variable venturi carburetors fell squarely within this more realistic description of the field in which the inventors endeavored, references relating to subsonic variable venturi carburetors were clearly within the field of the inventors' endeavor, for purpose of determining whether teachings rendered the claimed subject matter obvious. 35 U.S.C.A. § 103.

[5] **Patents 291 ⚿16.32**
291k16.32 Most Cited Cases
(Formerly 291k18)
For purpose of determining whether claimed invention for variable venturi apparatus for mixing and modulating liquid fuel and intake air for an internal combustion engine was obvious, since full knowledge by an inventor of all prior art in the field of his endeavor is presumed, teachings of subsonic variable venturi carburetors concerning alternative mechanisms for varying flow area in the venturi throat were properly combinable with teachings of prior patent concerning pollution reduction. 35 U.S.C.A. § § 102 , 103.

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[6] **Patents 291 16(2)**
291k16(2) Most Cited Cases
(Formerly 291k18)
Test for obviousness is not whether the features of one reference may be bodily incorporated into another reference; rather, court looks to see whether combined teachings rendered a claimed subject matter obvious. 35 U.S.C.A. § § 102 , 103.

[7] **Patents 291 16(2)**
291k16(2) Most Cited Cases
(Formerly 291k18)
Though an evaluation of claimed invention performed by an impartial, qualified third party is a valuable indication of nonobviousness of an invention, just as with testing done by an applicant himself, such an evaluation must compare the claimed invention with the closest prior art in order to be meaningful; otherwise, there is no basis for relating claimed inventions to prior art in order to conclude whether or not it is unexpectedly superior and therefore unobvious. 35 U.S.C.A. § § 102 , 103.

[8] **Patents 291 16(2)**
291k16(2) Most Cited Cases
(Formerly 291k18)
Evaluation which did not compare claimed invention with closest prior art did not rebut prima facie case of obviousness by proving that the claimed device was unexpectedly superior to the prior art. 35 U.S.C.A. § § 102 , 103.

Patents 291 328(1)
291k328(1) Most Cited Cases

Patents 291 328(2)
291k328(2) Most Cited Cases
868,251. Cited.

3,741,240 , 3,778,038. Cited.

Patents 291 328(2)
291k328(2) Most Cited Cases
1,258,153 , 2,052,225. Cited as a reference.

***1033** Richard M. Beck, Wilmington, Del., attorney of record, for appellants, John N. Hazelwood, Robert W. Mayer, Daniel Rubin, Dallas, Tex., of counsel.
Joseph F. Nakamura, Washington, D. C., for the Commissioner of Patents, Robert D. Edmonds, Washington, D. C., of counsel.

Before MARKEY, Chief Judge, RICH, BALDWIN and MILLER, Associate Judges, and NEWMAN, [FN*] Judge.

FN* The Honorable Bernard Newman, United States Customs Court, sitting by designation.

NEWMAN, Judge.
This is an appeal from the decision of the United States Patent and Trademark Office (PTO) Board of Appeals (board) sustaining the examiner's rejection under 35 U.S.C. s 103 of claims 36-38, entering a new ground of rejection under 35 U.S.C. s 102 of claim 36, and entering a new ground of rejection under 35 U.S.C. s 103 of claims 36 ***1034** and 37 of application serial No. 587,599, filed June 17, 1975, for "Variable Venturi Apparatus for Mixing and Modulating Liquid Fuel and Intake Air for an Internal Combustion Engine," a continuation-in-part of application serial No. 241,755, filed April 6, 1972, application serial No. 151,373, filed June 9, 1971, and application serial No. 168,233, filed August 2, 1971, now U.S. patent No. 3,741,240. We affirm.

Background

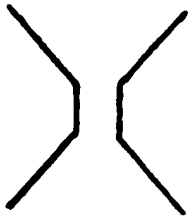
Appellants, Wood and Eversole, claim as their invention an improvement of the carburetor disclosed in a commonly assigned patent to Eversole and Berriman. [FN1] Both devices include a variable venturi. [FN2] They differ, however, in the means used to vary the venturi. In the Eversole and Berriman carburetor (Eversole I), the venturi flow area is varied by the up and down movement of a conically shaped pintle (26a) seated in the venturi throat (28a). [FN3] In the claimed invention, the venturi is varied by moving the walls defining the venturi flow area. [FN4] Appellants argue that the claimed invention is superior to Eversole I because it does not contain the pintle-type modulating***1035** structure and therefore eliminates the problems of centering and vacuum pull on the pintle. However, appellants have not submitted any evidence of comparative testing between the two devices.

FN1. U.S. patent No. 3,778,038, issued December 11, 1973, for "Method and Apparatus for Mixing and Modulating Liquid Fuel and Intake Air for an Internal Combustion Engine."

FN2. A venturi is a tube with a short narrow

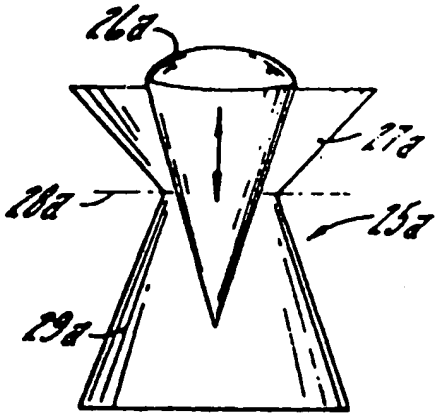
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center section (throat) and widened, tapered ends:

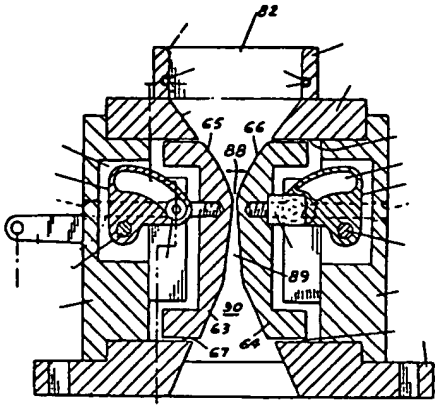


It is named for the Italian physicist, Giovanni B. Venturi, who discovered the phenomenon that as the velocity of the flow of fluid in the throat increases, the pressure decreases. Conventionally, automobile carburetors include a venturi in the main air passage to meter the fuel. In such a device, the pressure drop in the throat creates a pressure differential which causes the fuel to be drawn into the air passage. 2 McGraw-Hill Encyclopedia of Science & Technology, "Carburetor," McGraw-Hill Book Co., New York, New York, at 514-17 (4th ed. 1977).

FN3.



FN4.



Claim 36. A device for producing a uniform combustible mixture of air and minute liquid fuel droplets for delivery to an internal combustion engine includingmeans defining an intake air zone (82) connecting with means defining a throat zone (88) for constricting the flow of air to increase the velocity thereof,means for introducing liquid fuel into the air before the throat zone and uniformly distributing the fuel to minutely divide and uniformly entrain the fuel as droplets in the air flowing through the throat zone,Adjustment means for adjustably varying the area of the throat zone and controlling the rate of liquid fuel introduction in correlation with operating demands imposed upon the engine for which the mixture is produced,means defining a zone of gradually increasing cross-sectional area downstream from the throat zone (89, 90) for efficiently converting a substantial portion of the kinetic energy of the high velocity air and fuel mixture to static pressure whereby the velocity of the air and fuel mixture through the throat zone is sonic over a wide range of intake manifold conditions,The various zone defining means being together formed of oppositely positioned members (63, 64) spaced apart with walls (65, 66) defining a venturi flow passage intervening therebetween and supported with their passage defining walls in a generally coextensive and angularly fixed relation to each other, andWherein the adjustment means is operative to vary the flow area of the venturi flow passage without changing either the coextensive or angular relationship between the passage defining walls of the members.Claim 37. A device as in claim 36 wherein the adjustment means comprises Means to move at least one of the members laterally relative to both the axis of the passage and to the other of the members for operatively varying the flow area of the passage.Claim 38. A device as in claim 36 including Oppositely positioned wall means transversely movable relative to the axis of the passage intervening between the members, and The

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adjustment means is operative to displace the wall means toward and away from each other. (Emphasis added.)

Both the Eversole I patent and the application before us teach that maintaining the speed of the air-fuel mixture at sonic as it passes through the venturi throat over a wide range of intake manifold conditions reduces pollution from an automobile's exhaust. According to the inventors, the sonic velocity has the effect of more highly atomizing the air-fuel mixture which improves fuel utilization and thereby reduces the level of pollutants in the exhaust. Appellants offer as evidence of the nonobviousness of their invention an evaluation made by the Environmental Protection Agency (EPA) of a carburetor covered by claims 36 and 37, the Model 2 Dresserator. The EPA installed Model 2 Dresserators in a 1973 Chevrolet Monte Carlo and a 1973 Ford Capri, and found that both of the modified vehicles were capable of achieving the California 1975 interim emission standards. Further, the EPA noted that this finding was particularly significant since it was done without penalizing fuel economy and without the use of conventional emission controls such as oxidation catalysts.

The PTO made four separate rejections of the claims on appeal. Three rejections for obviousness involve a combination of the teachings of the Eversole I patent with the teachings of references disclosing conventional variable venturi carburetors, wherein the venturi is varied by moving the members which define the venturi flow area. Two of these, Bollee [FN5] and the German patent, [FN6] are used in a rejection of claims 36 and 37 because they show varying the venturi by lateral relative displacement of opposed venturi-defining pistons. Another reference describing the S.U. Carburetor, [FN7] is used in another rejection of claims 36 and 37 because it shows venturi variation by movement of a piston toward and away from a venturi-defining wall. The last two references, Shaw [FN8] and Hartshorn, [FN9] are used in the rejection of claims 36 and 38 because they show venturi variation by sliding a piston or plunger between and in contact with venturi-defining walls. The fourth rejection is for anticipation and is limited to claim 36. It is the board's position that claim 36 is drawn so broadly that it would cover the prior art Winfield carburetor, [FN10] a barrel carburetor wherein rotation of a cylinder throttle serves as a variable venturi.

FN5. U.S. patent No. 868,251, issued October 15, 1907, for "Carburetor."

FN6. German patent to Warmekraft G.m.b.H., No. 383,848, published October 18, 1923, for "Jet Carburetor with Variable Mixing Cross Section Acting Also as Throttle Cross Section."

FN7. Campbell, Colin, The Sports Car Engine, Its Tuning and Modification, "Variable Choke Carburettors: The S.U. Carburettor," Robert Bentley, Inc., Cambridge, Massachusetts, at 74-75 (1964).

FN8. U.S. patent No. 1,258,153, issued March 5, 1918, for "Carburetor."

FN9. U.S. patent No. 2,052,225, issued August 25, 1936, for "Carburetor."

FN10. Automobile Engines Handbook, No. 2, "Winfield Carburetor," American Technical Society, Chicago, Illinois, at 510-519 (1945).

Appellants argue before us that the obviousness rejections are improper because they combine nonanalogous references. According to appellants, in Bollee, the German ***1036** patent, the S.U. Carburetor, Shaw, and Hartshorn, the velocity of the air-fuel mixture at the venturi throat is necessarily subsonic in order for the venturi to perform its metering function. Furthermore, appellants submit that references relating to subsonic variable venturi carburetors are nonanalogous to references relating to sonic variable venturi carburetors and hence not properly combinable. Appellants also contend that the PTO did not give appropriate weight to the favorable evaluation of the claimed invention made by an impartial third party, the EPA, as evidence of the nonobviousness of their invention. With regard to the anticipation rejection, appellants maintain that in Winfield: varying the venturi by rotating the cylinder throttle changes the angular relationship of the venturi-defining walls; and fuel is introduced at and not before the venturi throat. [FN11]

FN11. Since we affirm the PTO's 103 rejections of claim 36, we do not need to reach the 102 rejection of that claim. However, in the interest of judicial economy, we point out that the claim limitation, providing that the venturi be varied "without changing Either the

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coextensive Or angular relationship" of the venturi-defining walls, is ambiguous. (Emphasis added.) This language can either mean that both the coextensive and the angular relationship must be unchanged or merely that at least one of these two relationships must be unchanged. Moreover, we note that if Winfield is an updraft carburetor, as alleged by the PTO, then fuel is introduced before the venturi throat created at the top of the cylinder throttle.

OPINION

Nonanalogous Art

[1] [2] In resolving the question of obviousness under 35 U.S.C. s 103, we presume full knowledge by the inventor of all the prior art in the field of his endeavor. However, with regard to prior art outside the field of his endeavor, we only presume knowledge from those arts reasonably pertinent to the particular problem with which the inventor was involved. In re Antle, 444 F.2d 1168, 1171-72, 58 CCPA 1382, 1387, 170 USPQ 285, 287-88 (1971). The rationale behind this rule precluding rejections based on combination of teachings of references from nonanalogous arts is the realization that an inventor could not possibly be aware of every teaching in every art. Thus, we attempt to more closely approximate the reality of the circumstances surrounding the making of an invention by only presuming knowledge by the inventor of prior art in the field of his endeavor and in analogous arts.

[3] The determination that a reference is from a nonanalogous art is therefore two-fold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.

[4] In the case at bar, the references relating to subsonic variable venturi carburetors are clearly within the field of the inventors' endeavor. Appellants' assertions suggesting otherwise contradict statements made in their own specification. In the Background of Invention section of appellants' specification, appellants state that "the field of art to which the invention pertains includes the art of internal combustion engines and more particularly to such art as it applies to fuel and air induction systems therefor." Subsonic variable venturi carburetors fall squarely within this more realistic description of the field in which appellants endeavored.

[5] [6] Since we presume full knowledge by the inventor of all prior art in the field of his endeavor, the teachings of the subsonic variable venturi carburetors concerning alternative mechanisms for varying the flow area in the venturi throat are properly combinable with the teachings of the Eversole I patent concerning pollution reduction, i. e., that pollutant levels in automobile exhaust can be reduced by maintaining the speed of the air-fuel mixture through the venturi throat at sonic over a wide range of intake manifold conditions. The argument that one cannot bodily incorporate the two sets of references because in one the speed of the air-fuel mixture is allegedly subsonic, whereas in the other it is sonic, is irrelevant.***1037** The test for obviousness is not whether the features of one reference may be bodily incorporated into another reference. In re Bozek, 416 F.2d 1385, 1390, 57 CCPA 713, 719, 163 USPQ 545, 549-50 (1969) ; In re Mapelsden, 329 F.2d 321, 322, 51 CCPA 1123, 1126, 141 USPQ 30, 32 (1964). Rather, we look to see whether combined Teachings render the claimed subject matter obvious.

Impartial Evaluation by Qualified Third Party

[7] Of course, an evaluation of a claimed invention performed by an impartial, qualified third party is a valuable indication of the nonobviousness of an invention. However, just as with testing done by an applicant himself, such an evaluation must Compare the claimed invention with the Closest prior art in order to be meaningful. See In re Merchant, 575 F.2d 865, 869, 197 USPQ 785, 788 (Cust.Pat.App.1978) ; In re Holladay, 584 F.2d 384, 386, 199 USPQ 516, 518 (Cust.Pat.App.1978). Otherwise, there is no basis for relating the claimed invention to the prior art in order to conclude whether or not it is unexpectedly superior and therefore unobvious.

[8] The EPA test data, while impressive, does not compare the claimed invention with the closest prior art, the Eversole I device. Consequently, this evaluation does not rebut the Prima facie case of obviousness by proving that the claimed device is unexpectedly superior to the prior art. To the contrary, since the prior art Eversole I carburetor also provides for sonic velocity of the air-fuel mixture at the venturi throat over a wide range of intake manifold conditions, it too would be expected to

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reduce pollutant levels in an automobile's exhaust.

Accordingly, for the reasons set forth herein, the decision of the board is Affirmed.

AFFIRMED.

Cust. & Pat.App., 1979.
Application of Wood
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